Improving Human Papillomavirus (HPV) Vaccine Rates Using Evidence-Based Communication Strategies for Provider Education

DNP Final Project

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By

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Abstract

Introduction: Human Papillomavirus (HPV) causes 32,500 new cancers and roughly 14 million new infections annually in the United States. These cancers include cervical, oropharyngeal, anal, vaginal, vulvar, penile cancers and genital warts (Centers for Disease Control and Prevention (CDC), 2015). While the HPV vaccine was approved in 2006, HPV vaccination rates are not progressing as planned toward the Healthy People 2020 goal of 80% coverage, with Ohio rates in the 50-59% range.

Purpose: The purpose of this project is to identify HPV immunization initiation rates and to implement a communication strategy to improve rates for adolescent patients.

Methods: This DNP project pilot tested an evidence-based provider communication intervention with goal of improving HPV vaccination rates in an adolescent population, 11-18 years of age. Impact of the educational intervention was evaluated by comparing pre-intervention and post-intervention HPV vaccination rates in a Midwest pediatric primary care practice.

Results: A total of 1024 total patient records identified both pre-intervention and post-intervention that met inclusion criteria. Between the four providers, the total patient counts ranged from 108 to 610. Pre-intervention vaccination rates ranged from 44.43% to 59.30%. Post-intervention vaccination rates ranged from 47.86% to 62.78%. The change in satisfaction increased across all providers ranging from 3.71% to 8.60%

Conclusions: The intervention was found to be a cost-effective and time-sensitive intervention to promote improved HPV vaccination rates. Overall, the average rate increased from 49.31% to 53.01%

Section One: Nature of the Problem

1. Introduction to the Problem

Human Papillomavirus (HPV) causes 32,500 new cancers and roughly 14 million new infections annually in the United States. These cancers include cervical, oropharyngeal, anal, vaginal, vulvar, penile cancers and genital warts (Centers for Disease Control and Prevention (CDC), 2015); CDC, 2018). HPV vaccination prevents cervical cancer, uncomfortable testing and treatment, and can prevent cancers of the oropharynx and anus/rectum where there is no cancer screening tests (CDC, 2018). Worldwide, HPV infection is responsible for one-half million cases of cancer and more than 250,000 deaths every year (White, 2014).

In 2006, the HPV vaccine was approved by the FDA to prevent contracting the human papillomavirus types that cause cancers and genital warts was recommended by the Advisory Committee on Immunization Practices (ACIP) for regular use in females in 2006 and males in 2011. More than a decade later, vaccination rates remain below the goal of Healthy People 2020 of 80% coverage of the population, with only 50% of females and 38% of males having completed the HPV vaccination series. Adolescents may receive the HPV vaccination at the same visit as Tdap and meningococcal vaccine yet often do not. The result is an almost 100% effective cancer prevention and HPV-related disease vaccine goes unused in a large part of the population. Understanding parents' concerns and provider communication behaviors with patients and families, effective interventions can be created to increase HPV vaccination rates. (Cates, et al., 2018).

The HPV vaccine is recommended by the CDC for both males and females. Commonly administered at 11 or 12 years of age, it can be given at 9 years through 26 years of age (CDC, 2016). The U.S. Department of Health and Human Services report (2015) that HPV vaccination

rates are not progressing as planned toward the Healthy People 2020 goal of 80% coverage (Gilkey et al., 2015). The CDC (2017a) report 50-59% HPV vaccination rates for the state of Ohio and national coverage at 60% were reported for 2016-2017. These rates are below the goal rate of 80%. Reported contributing factors to under-utilization of the HPV vaccine include cost, lack of access to primary care, inaccurate information in the media, negative parental attitudes regarding general vaccinations. Ethical issues surrounding the HPV vaccination include whether the vaccine increases the early onset of sexual activity and whether to vaccinate people who have opted to abstain from sex. These questions extend to the manufacturers of the HPV vaccines as well, regarding the safety and efficacy of the vaccine and the need for research to continue the cycle of improved, viable products (White, 2014). Health policy issues which have focused on attempts to use policy changes to increase HPV vaccination rates, such as compulsory HPV vaccination for school entry, have proved unsuccessful and ineffectual (Dempsey et al., 2018). Research suggests that improving health care provider communication behaviors is crucial to increase HPV vaccination rates, especially in primary care, where the majority of HPV vaccines are given (Gilkey et al., 2015).

Parental concerns about vaccine safety, efficacy and insufficient research when promoting the HPV vaccination to patients and their families are of interest to pediatric primary health care providers. Addressing the negative attitudes about HPV vaccination outcomes secondary to the dissemination of inaccurate information from social media and lack of support from significant others are ongoing struggles for the pediatric primary care provider. The need to be properly prepared to respond to the misinformation, information deficits, and overall lack of HPV vaccination knowledge is required to reach the Healthy People 2020 goal of 80% coverage (Zimet, et al., 2013).

2. *Purpose of project*

The purpose of this project is to identify HPV immunization initiation rates and to implement a communication strategy to improve rates for adolescent patients. To implement this project, internal HPV immunization rates were assessed in a Midwest primary care pediatric practice for four health care providers (2 physicians and 2 nurse practitioners). These findings were used to inform the development of quality improvement communication strategies to increase HPV vaccination rates. The population of interest is male and female adolescents ages 11 to 18 years.

This DNP project serves as pilot testing of a provider-focused educational intervention to improve provider communication strategies to increase HPV vaccination rates in adolescents 11 to 18 years in a private pediatric practice.

Section Two: Review of the Literature

1. *Clinical Practice Problem Statement.*

With the HPV vaccine being most effective prior to sexual activity and possible exposure, it is crucial to examine the influence of health care provider communication with patients and families when recommending the HPV vaccine (Perkins, et al., 2014). To locate the related external evidence, the following PICOT question was generated.

P (patient population): In pediatric patients

I (Issue of interest): how does the content and delivery of provider communication about HPV vaccines

C (Comparison Intervention or Issue of interest) compared to no provider communication

O (Outcome): impact HPV immunization initiation rates

T (Time): over a 6 week period?

2. *Evaluation and Summary of the Evidence in the Literature*

In the pediatric population, optimal administration of the vaccine is prior to possible HPV exposure through sexual activity, ages 9 to 14 years of age (CDC, 2015). The goal of the HPV vaccine is to lower HPV related cancers and their sequelae to those most vulnerable (Gostin, 2011). As internal immunization rates were examined, evidence demonstrated that provider recommendations and communication behaviors consistently influence compliance in adolescents receiving the HPV vaccination (CDC, 2015). Other factors influencing health care provider communication is the environment in which the information is being shared, support staff, and the time allowed to answer patient questions and discuss the HPV vaccination with patients and their families (Dempsey et al., 2018).

When communication best practices are not identified and made consistent across health care providers, results include missed immunization opportunities, placing pediatric patient's health at risk unnecessarily and a possible increase in HPV-related cancers (Perkins, et al., 2014). Colleagues, peers, and health care providers should advocate for best practice communication guidelines for disease prevention, mental and health anguish avoidance, and the expense of HPV related disease treatment (CDC, 2015).

A literature review was conducted using CINAHL, PubMed, PsycINFO, and EBSCO Host databases to find information on HPV vaccination provider communication for publication years 2008-2018, as approval by the U.S Food and Drug Administration (FDA) for HPV vaccine was 2006. An internet search was also completed to locate additional information from government resources and reliable organizations. Search terms included: provider communication, HPV communication, human papilloma vaccination, HPV vaccine education, HPV vaccination and quality improvement, provider communication and time allowed, and

provider education. See appendix A for the evaluation table of the external evidence. .

3. Critical Appraisal of the Evidence

A synthesis of the literature included random controlled trials, qualitative and descriptive studies, cross-sectional surveys, meta-analyses, mixed methods, and literature reviews. Most of the research articles addressed the relationship between provider communication and HPV vaccination uptake. There was some variance in interventions combined with communication training, as Dempsey, et al. (2018) utilized information sheets, a parental education website, and disease images; Rand, et al. (2018) included performance feedback and learning collaborative calls; Perkins, et al. (2015) employed quality improvement incentives, repeated contacts, and individualized feedback; Sussman, et al. (2015) utilized social media and health system improvements; and Groom, et al. (2017) included an education session on HPV information, system-wide assessment and feedback, and facility-specific coverage data respectively. The evidence indicated that provider communication was an influential factor that increased HPV vaccination opportunities and rates.

Ten of the nineteen studies appraised noted that strong, high-quality health care provider professional recommendations increased HPV vaccine administration. Five of the nineteen studies appraised indicated that the greater health care provider knowledge base was about HPV disease, the HPV vaccine, and current guidelines, this increased knowledge was associated with higher rates of HPV vaccination initiation and completion. The research also overwhelmingly agreed that an intervention developed for improved provider communication was needed to achieve higher HPV vaccination rates that were sustainable (Dempsey, et al., 2018; Rand, et al., 2018; Clark, et al., 2016; Sussman, et al., 2015; Cates, et al., 2018; Fairbrother, et al., 2013; McRee and Gilkey, 2014; Moss, et al., 2016; Gilkey, et al., 2015; Gilkey, et al., 2016; Smith, et

al., 2016; Finney, et al., 2017; Perkins, et al., 2015; Kornides, et al., 2018; Groom, et al., 2017; Reno, et al., 2018).

Gaps in Evidence

Gaps that influence communication strategies include patient demographics, socio-economic levels, and level of education. More research is needed about the influence of health care provider self-reporting overestimation for vaccine support and on the effects of health care provider incentives for vaccine recommendation. Additionally, the role of parents' communication satisfaction, the role of provider recommendation quality, vaccine confidence, and parent-provider relationship quality are areas that need further research investigation (Kornides, 2018). While these may play a role in HPV vaccination uptake, the focus for this project was provider education.

4. Presentation of the Theoretical Basis

Pender Health Promotion Model (Appendix B)

The Pender Health Promotion Model (HPM) is an appropriate framework for this project as it focuses on three areas: individual characteristics and experiences, behavior-specific cognitions and affect, and behavioral outcomes. Two of the assumptions of the HPM also compliment the importance of communication: health care providers are a part of a patient's interpersonal environment that influences people and self-initiated reconfiguration is essential to changing behavior. Furthermore, of the theoretical statements derived from the HPM: persons commit to engaging in behaviors they perceive a benefit and persons can modify thoughts, affect and the interpersonal and physical environment to create incentives for health actions are also pertinent to improved HPV vaccination communication (Petripin, 2016).

The role of communication by health care providers is vital to vaccination rates for multiple reasons. Children do not get the HPV vaccine if patients and families do not know the value of the vaccines in disease prevention. In addition, vaccination initiation timing, the recommended vaccination schedule and understanding of the vaccine details is neglected when patients and families are not afforded the time to ask questions (Waisbord and Larson, 2005). Pender's Health Promotion Model is applicable in understanding behavior-specific cognitions and affect influence the communication strategies health care providers utilize. The HPM recognizes the importance and influence health care providers possess on patient decisions, including those to vaccinate. Lastly, the HPM is relevant in perceived benefit of both the health care provider and patient. Patients will commit to vaccination if they perceive the benefit communicated by the health care provider. Health care providers will commit to a behavior change in communication strategies when they, as well understand the perceived benefit of increased HPV vaccination rates (Petripin, 2016).

Evidence-Based Practice Model: IOWA (Appendix C)

The Iowa Model of Evidence-Based Practice to Promote Quality provides specific steps for implementing evidence-based practice change. The Iowa model begins by identifying "triggers" or practice questions through recognition of a clinical problem. The trigger for this project is the lagging HPV vaccination rates and stagnant progress towards the desired 80% coverage goal from the Department of Health and Human Services (2015) report Healthy People 2020. The next step in the Iowa model is determining if the clinical problem is a priority and a clinically relevant practice question that can be tackled using the EBP process. Improving HPV vaccination rates in the adolescent population is a priority for the clinical setting for this project, the state of Ohio, and nationally. National HPV vaccination coverage is 60% and the state of

Ohio is 50-59% on average for initiation rates. Nationally 49% of adolescents were up-to-date on the HPV vaccine, 40-49% for the state of Ohio respectfully for completion rates (CDC, 2017). A team was formed and was comprised of stakeholders, including APRNs, physicians, staff, and organizational leaders. The evidence was reviewed, synthesized, and evaluated. Using the evidence, a provider education intervention was developed and piloted in practice, selecting patient health outcomes, collecting baseline data, designing evidence-based guidelines, evaluating the process, and modifying practice guidelines accordingly.

In this project, the intervention in the form of a provider communication education session combining information on HPV disease, HPV vaccination, parental communication strategies, high-quality recommendation verbiage, and emphasizing cancer prevention is pilot tested.

Following the pilot, a determination is made regarding the effectiveness and appropriateness and a decision to implement or modify the interventional provider communication education session. If the education session results in improved outcomes such as increased HPV vaccination rates, then the integration into clinical practice would be facilitated by leadership, education support, and ongoing monitoring of outcomes.

The provider communication education session would also consider the environment and time allotted, clinician and staff feedback, cost-effectiveness, and the acceptance of information by patients and families, with HPV vaccination rate increases reflecting outcome success. Lastly, dissemination of project findings would be shared through clinical site presentation and publication, supporting the growth of EBP culture and the spirit of inquiry (Melnyk and Fineout-Overholt, 2015).

This project used the internal evidence collected in a real world clinical setting, supporting the literature that HPV vaccination rate uptake is not satisfactory and a provider communication intervention is a sound means to increase HPV vaccination rates (Dempsey, et al., 2018; Hudson, et al., 2016; Rand, et al., 2018; Clark, et al., 2016; Sussman, et al., 2015; Fairbrother, et al., 2013; McRee and Gilkey, 2014; Zimet, 2013; Moss, 2016; Smith, et al., 2016; Finney, et al., 2017; Perkins, et al., 2015; Kornides, et al., 2018; Reno, et al., 2018).

Utility/Feasibility: Approach to Improve Communication Best Practices

Educating health care providers about the methods to approach, articulate, and advocate for the administration of the HPV vaccination to achieve the highest immunization rates based on evidence-based practice rules that can be guided by both Pender's Health Promotion Model and IOWA Model is the overall quality practice change goal. The primary care office setting was an appropriate site as research suggests this is where the majority of adolescents are receiving their HPV vaccinations (Gilkey, et al., 2015). Collecting internal evidence that is occurring in a real-life clinical setting does not put human subjects at risk because HPV vaccination rates are created automatically through the quality tab in the patient's electronic chart for that age group parameter. Athenanet, the electronic charting system, can create quality management reports where patient data is not identified, age range specific, and are unique to each provider using the updated vaccine recommendations by the Advisory Committee on Immunization Practices (ACIP). This project met the criteria for exemption from institutional review board oversight due to the quality improvement focus. The development of a provider communication session, using evidence-based research quality improvement communication strategies is fitting to achieve higher, sustainable HPV vaccination rates (Dempsey, et al., 2018; Rand, et al., 2018; Clark, et al., 2016; Sussman, et al., 2015; Cates, et al., 2018; Fairbrother, et al., 2013; McRee and

Gilkey, 2014; Moss, et al., 2016; Gilkey, et al., 2015; Gilkey, et al., 2016; Smith, et al., 2016; Finney, et al., 2017; Perkins, et al., 2015; Kornides, et al., 2018; Groom, et al., 2017; Reno, et al., 2018). In regards to clinical feasibility, a provider communication education session is a cost-efficient intervention that can be done in office, flexible to the provider's schedule. The session would an hour, respecting clinical patient care obligations. In promotion of the provider communication education session, the healthcare organization would be committed to the success of the intervention, supporting the desired outcome of improved HPV vaccination rates. See Appendix D for the provider educational intervention content.

The benefits of the provider communication education session are far reaching when considering the increased uptake of HPV vaccination rates. Public health benefits include the reduction of HPV disease and HPV-related cancers and reduced pediatric health risk. Additionally, the mental and health anguish that is associated with HPV cancer sequelae and treatment would be avoided. HPV-related disease treatment costs would also experience a reduction with increased HPV vaccination rates (Perkins, et al., 2014; CDC, 2015). The only notable risk is that the providers are not vested in the HPV vaccination rate change communication education session, depleting the necessary buy in to promote the HPV vaccination for uptake improvements.

When implementing the provider communication education session, budgetary concerns are minimal. If implemented around the provider clinical schedule, there will be no loss of income from reduced patient care. The education session itself, is an hour long verbal/PowerPoint presentation and discussion with no added operational cost and can be provided in provider's office space.

Evaluation

In this pilot project, the provider communication education session implemented was evaluated by comparing HPV vaccination rates for 6 weeks prior to session implementation compared to the rates 6 weeks after implementation. Quality measure reports were generated to examine HPV vaccination rates (%) for each provider using the age parameters of 11 to 18 years of age. Health status impact can be identified through the benefits of vaccination. Merits reach beyond the direct prevention of HPV disease, extending protection across the life course, prevent outcomes in communities, stabilize health care systems, promote health care equity, and lessen the burden for local and national economies (Wilder-Smith, et al., 2017; Durham, et al., 2016).

5. *Recommendations Summary*

The focus of this project was to evaluate the impact of an evidence-based, provider-focused communication strategy on HPV vaccination rates in adolescents, 11 to 18 years in age. Steps to evaluate the outcome of improved HPV vaccination rates. Outcomes were evaluated by comparing internal HPV immunization initiation rates in a private pediatric primary care practice comprised of four health care providers for 6 weeks prior to and 6 weeks following the provider education intervention to promote evidence-based communication strategies with patients and parents regarding HPV vaccinations. The evidence that is collected is vital as it relates to the Department of Health and Human Services report (2015) of HPV vaccination rates not progressing as planned toward the Healthy People 2020 goal of 80% coverage (Gilkey, et al., 2015). This project reflects the internal evidence collected in a real life clinical setting, supporting the literature review that HPV vaccination rates are not progressing toward national goals and a provider communication education session is one intervention, driven by evidence, that can increase HPV vaccination rates (Dempsey, et al., 2018; Hudson, et al., 2016; Rand, et

al., 2018; Clark, et al., 2016; Sussman, et al., 2015; Fairbrother, et al., 2013; McRee and Gilkey, 2014; Zimet, 2013; Moss, 2016; Smith, et al., 2016; Finney, et al., 2017; Perkins, et al., 2015; Kornides, et al., 2018; Reno, et al., 2018). Increased HPV vaccination rates will reduce HPV-related cancers and death worldwide, thus improving population patient health outcomes and quality of care, local and state economies and health care costs, and stabilization of healthy systems (Perkins, et al.,2014; CDC, 2015; Wilder-Smith, et al., 2017).

Stakeholders in this quality improvement pilot include the Advanced Practice Nurses (APRNs) and physicians recommending the vaccine, as well as the patients and families that are receiving the vaccine information. Engagement of stakeholders will be approached by providing the APRNs and physicians with their individual HPV vaccination rates. The need for communication was understood when the provider vaccination rate is noted as subpar according to the desired Healthy People 2020 80% rate (Gilkey, et al., 2015). Potential barriers for a provider communication education session include time and varying schedules, perceived benefit, and personal views of HPV vaccination (Gilkey, et al., 2015). Time and varying schedules may be addressed by providing the education session at the clinical practice site at lunch when offices are typically closed, making it convenient for the health care provider. Perceived benefit and personal views are more difficult to address, however, providing factual information regarding the efficacy and widespread acceptance of the HPV vaccination, in addition to the determined Healthy People 2020 goals for HPV vaccination rates would be beneficial in opening minds to support the need for communication practice change.

Section Three: Methods

1. *Recommendations for implementation of practice change*

Per the CDC, the HPV vaccine is recommended for adolescents of both genders between the ages of 11 and 14, with an age range of 9 to 26 years of age. Based on the evidence acquired, reviewed, and evaluated, it is recommended that a provider communication education session be implemented as an intervention to increase HPV immunization rates. The provider communication education session based on evidence should integrate information on HPV disease, HPV vaccination, parental communication strategies, high-quality recommendation verbiage, and an emphasis on cancer prevention.

Plan for implementation of the EBP practice change

From the evidence-based recommendations, the strategy of implementing a provider communication education session that encompasses the need for information on HPV disease, prevalence, and sequelae, HPV vaccination current rate for Ohio, the United States and the health care provider participating, and effective methods for communicating with parents, including high-quality recommendation verbiage, and emphasizing cancer prevention. This project will include the development and implementation of a provider communication education session for data collection to evaluate initiation vaccination rate trends, with consideration given to time constraints. The clinical agency served as the provider communication education session setting, in addition to serving as the specific practice for the collection of internal HPV immunization initiation rate evidence for four health care providers, using the evidential findings for the development of strategies to improve HPV vaccination rates.

Sample, Practice Setting, Clinical Context Description, Patient preferences

The focus patient population being reviewed for HPV vaccination initiation rates was pediatric patients, ages 11 to 18 years. This age range was selected because HPV vaccines are recommended and administered at 11 years old clinically with the Tdap and meningococcal before 7th grade entrance. HPV vaccination initiation rates were analyzed for 6 weeks prior to the provider education intervention to gather pre-intervention baseline data; and analyzed for pilot testing of the communication strategy and for 6 week following the intervention to determine an impact of the intervention. The pre- and post-vaccination rates provide quality improvement data to assess initial and ongoing the potential impact of the provider communication-strategy education on patient outcomes. The practice and clinician-specific vaccination rates included two pediatric physicians and two pediatric nurse practitioners in a private pediatric primary care setting. The pediatric population serviced in this pediatric primary care office are 50% Caresource/Medicaid (state insurance) and 50% private insurance. This practice setting and patient population are comparable to those described in the literature. The pediatric primary care office was an appropriate setting secondary to the patient population, inclusion of both physicians and nurse practitioners vaccination rates, and the fact that the majority of HPV vaccines are given in primary care (Gilkey, et al., 2015).

Readiness for Change

This pediatric primary care office is vested in this project because of project manager's status as a provider in the practice and by reason of understanding the importance for quality measures and patient health in regards to the HPV vaccination. This practice is ready and open to adopt strategies to improve provider HPV vaccination rates based on research and evidence based findings.

Procedure for Practice Change

A provider-communication education pilot session was developed and implemented using evidence based strategies that combine information on HPV disease, HPV vaccination, parental communication tactics, high-quality verbiage, and cancer prevention. See Appendix D for the provider educational intervention content. Following the pilot, the effectiveness and appropriateness of the intervention will determine if the education session needs modified. To evaluate the impact of the pilot communication strategy on the patient-centered HPV vaccination initiation rates, data were collected for 6 weeks prior to implementation of the provider education intervention and for 6 weeks post-communication intervention.

Potential barriers include provider time and varying work schedules, provider buy-in, and personal bias. Time and work schedule variances can be addressed through education session presentation flexibility to avoid conflict with patient appointments. Provider buy in and personal bias can be addressed through providing factual information on the efficacy and acceptance of the HPV vaccination, the Healthy People 2020 HPV vaccination goal, and the immediate and long-term benefits of the HPV vaccination (DaRosa, et al., 2011; Gilkey, et. al., 2015).

Potential facilitators include leadership and administrative support, minimal budgetary concerns, minimal time for implementation, responsive data gathering and analysis, and evidence-based HPV vaccination findings. Leadership and administrative support is key to access statistical information and quality indicators, as well as additional endorsement for providers to take into consideration the information being provided in the education session. Minimal budgetary concerns and supplies are advantages to the organization and practice as cost-effective. Evidence-based HPV vaccination findings confirm the value of a provider communication education session as a means to increase HPV vaccination rates (Dempsey, et al.,

2018; Hudson, et al., 2016; Rand, et al., 2018; Clark, et al., 2016; Sussman, et al., 2015; Fairbrother, et al., 2013; McRee and Gilkey, 2014; Zimet, 2013; Moss, 2016; Smith et al., 2016; Finney, et al., 2017; Perkins, et al., 2015; Kornides, et al., 2018; Reno, et al., 2018).

Measurement methods/tools

The objectives for this project were met using the following procedures:

- Collection of HPV vaccination initiation rates for the specific pediatric primary care practice (6 weeks prior to communication strategy pilot test and 6 weeks post communication strategy pilot test);
- Collection of HPV vaccination standards for the project specific pediatric primary care practice, as well as state and national vaccination standards;
- Application of quality indicators for improvement strategy development;
- Description of a comprehensive communication strategy description based on published, evidence-based literature.

This DNP project pilot tested a provider communication intervention, evaluating impact by comparing pre-intervention and post-intervention HPV vaccination rates in a Midwest pediatric primary care practice.

Collecting internal evidence of the pre-implementation 6 week provider immunization initiation rates and post-implementation 6 week immunization initiation rates will be accomplished using the already in place electronic charting system, Athenanet in the primary care office. Athenanet can create quality management reports that do not identify patient data, are age-range and time-range specific, and are exclusive to that provider using the updated vaccine recommendations by the Advisory Committee on Immunization Practices (ACIP).

Data collection process/Data analysis

A Quality Management Report (QMR) is a tool that allows a user to create reports by quality measure and program, provider, and specialty. The report can be used to benchmark provider performance internally or against external performance targets. The QMR is built off the Quality Management Engine (QME) which is a rules engine that continuously evaluates patient data to determine if a quality measure has been satisfied. The provider performance rate is a percentage over the patient population, time period, and age parameters selected. Reports were run to ascertain HPV vaccination rate performance including HPV vaccination initiation rates across multiple providers and as the practice as a whole to make decisions on quality improvement initiatives.

HPV vaccination initiation provider rates were gathered for 6 weeks before and after implementation of the provider education session on HPV communication strategies. Due to time constraints of the project, continued data collection and analyses beyond the timeframe of the current project will be performed for future evaluation to best ascertain the provider vaccination rate data and trends. According to the US Preventative Services Task Force (2017), attempts to quantify the magnitude of benefit from implementing a primary care preventative service may take years to achieve. Thus, yearly attempts to quantify progress in immunization rates is planned.

Practice model use analysis

The Iowa Model of Evidence-Based Practice to Promote Quality provides guidance when making decisions about administrative and clinical practices that affect patient health outcomes (Titler, et al., 2001). This model can be applied to the implementation and dissemination of this project through the piloting of the provider communication education session. Before and after

the provider communication education session is completed, provider vaccination rates would be examined to evaluate the process and desired outcomes. If, as the literature supports, the communication education session increases vaccine uptake, this education session can be adopted into practice and results disseminated to help other providers increase their vaccination rates.

Proposed budget, time, and resources plan

Expenditures were minimal for this pilot project due to support of the practice. Practice support included coverage of the education time for presentation preparation and delivery. The only expenses were color copying for 4 copies of the presentation ($17.80) and rental of a portable projection screen ($53.57).

The timeline of the project occurred over the 4th quarter of 2018 and the first quarter of 2019. The project used the Athenanet Quality Management System to generate vaccination initiation rate reports before and after pilot implementation of the provider communication strategy. The use of the Athenanet Quality Management System required continued support from leadership. Other resources included a meeting place (i.e., office lunch room) for presentation and the providers receiving the communication education session.

Section Four: Findings

1. *Results*

Based on evidence obtained, assessed, and evaluated, a provider communication education session was implemented as an intervention to increase HPV immunization rates in a pediatric primary care office. The provider communication education session was presented to four pediatric providers on evidence-based communication strategies for communicating with caregivers about the HPV vaccine. The provider communication education session was verbally

given with the aid of a PowerPoint presentation (Appendix D) on January 14, 2019. Data for HPV vaccine initiation rates were examined 6 weeks prior to session implementation and compared with 6 weeks post session implementation.

Quality measure reports were generated to examine HPV initiation vaccination rates (%) for each provider using the patient parameters of 11 to 18 years of age. The quality measure report identifies Provider A, B, C, D, the number of patients seen in the age 11-18 years parameter and the number of patients that received their HPV vaccine that is given a "satisfied" status to qualify for HPV vaccine initiation. A satisfied status indicates documentation of HPV vaccination discussion. An overall HPV initiation vaccination rate (%) is assigned to each provider 6 weeks prior to intervention implementation and 6 weeks post implementation. The change in HPV vaccination rate were calculated for each provider by comparing post-intervention rate to pre-intervention rate.

Weighted Satisfaction Rates

Because each provider interacted with a different number of patients, the satisfaction scores were required to be weighted to reflect the true impact of each provider. To calculate the satisfaction rate for each provider, the number of patients determined to have satisfactory HPV interaction was divided by the total number of patient seen in each epoch (pre-implementation and post-implementation). The individual provider satisfaction score was then multiplied by the weight to determine a true rate related to the overall practice. Overall, all providers (A, B, C, D) increased their HPV vaccination uptake rates individually and by an average of 3.7% for the primary care pediatric practice as a whole for patients 11-18 years in the 6 weeks post implementation of the provider communication education session.

Pre-Implementation Results

Table 1 reports data collected on HPV initiation vaccination rates for four providers (A,B,C,D) 6 weeks prior to and following the implementation of the provider education intervention. The quality reporting system identified 1024 total patient records that were eligible, active, and met age criteria. Between providers, the total patient counts ranged from 108 to 610, with weighted pre-intervention satisfaction rates ranging from 44.43% to 59.30%.

Table 1: Provider –specific satisfaction rates (SR) before and after the communication strategy implementation in the clinical site

Provider	Pre-Program Count	Pre-SR %	Post-Program Count	Post –SR%	Change in Satisfaction (%)
A					
Total Patients	108		108		
Needs Data	48		44		
Satisfied	60	55.55%	64	59.26%	+ 3.71%
Weight (10.54) SR		5.85		6.25	
B					
Total Patients	134		134		
Needs Data	62		55		
Satisfied	72	53.73%	79	58.96%	+ 5.23%
Weighted (13.08)SR		7.03		7.71	
C					
Total Patients	172		172		
Needs Data	70		60		
Satisfied	102	59.30%	108	62.79%	+ 4.41%
Weighted (16.79) SR%		9.96		10.54	
D					
Total Patients	610		610		
Needs Data	339		318		
Satisfied	271	44.43%	292	47.86%	+ 8.60%
Weighted (59.57) SR		26.47		28.51	
Overall Total Patients	1024		1024		
Overall Satisfaction Rates		49.31%		53.01%	+ 3.7%

Legend: SR = satisfaction rate; % = percentage

2. Post-Implementation Results

Also reported in Table 1 is the 6 weeks post- implementation data. The quality reporting system identified 1024 total patient records there were eligible, active, and met age criteria. Between providers, the total patient counts ranged from 108 to 610 (consistent with total patient counts in the pre-intervention count), with weighted post-intervention satisfaction rates ranging from 47.86% to 62.78%. To determine change in satisfaction score, each provider's pre-intervention satisfaction percentage was subtracted from their post-intervention satisfaction percentage to generate the change in satisfaction score. The change in satisfaction increased across all providers ranging from 3.71% to 8.60%.

3. Discussion and Conclusions

Pediatric patients remain a vulnerable population to the most common sexually transmitted infection in the United States, the Human Papilloma Virus (HPV). Understanding and addressing parental concerns, being knowledgeable about HPV vaccine and disease, recommending the HPV vaccine with the same strength as Tdap and Menactra (meningococcal), emphasizing cancer prevention, and delivering a consistent message to parents among providers according to evidence-based literature findings has shown to be reliable elements to incorporate into provider education to increase an almost 100% effective cancer prevention vaccine (Cates et al., 2018).

Overall, the DNP project pilot tested a provider education session aimed at quality improvement for evidence-based communication strategies for improving HPV vaccine uptake, and a limited evaluation of HPV vaccine initiation rates was conducted for four providers in a specific pediatric primary care practice. The intervention was found to be a cost-effective and time-sensitive intervention to promote improved HPV vaccination rates. Overall, the average rate

increased from 49.31% to 53.01%. Data was successfully collected, analyzed, and evaluated 6 weeks prior to and post implementation of provider communication education pilot session for a specific pediatric primary care practice. Vaccination rates for the state of Ohio and nationally were gathered successfully as benchmark data. The provider communication education pilot session was developed using quality indicators and evidence-based literature reflecting provider recommendations and communication behaviors that consistently influence compliance. Findings suggest that provider communication behaviors can be positively influenced and improved using key elements to create increased HPV vaccination initiation rates. Future endeavors include re-delivery of the provider education intervention on a regular basis to be determined. Interventions to promote HPV vaccinations are planned with the goal of an 80% vaccination rate.

4. Limitations

The provider communication education session is a clinically feasible intervention that is cost-effective, sensitive to provider obligations, less than one hour, and directed at providers in a straight-forward manner in how and why increased HPV vaccine uptake is vital. The pediatric primary care intervention site and healthcare organization was supportive of the desired outcome of improved vaccination rates and vested in the success of the intervention which aided in statistical data collection and quality measurements. Potential barriers for future interventions include time and varying schedules, perceived benefit, and personal views of the HPV vaccination.

Limitations in this project included the time constraints of post intervention data. Longer time frames for data collection would be preferred for future evaluations to better ascertain the provider vaccination rate and data trends. According to the US Preventative Services Task Force

(2017), quantifying the impact and benefit from a primary care intervention may take years to achieve. Thus, continued data collection at 6 months and yearly to provide further data on vaccination initiation rates would be advised. Furthermore, this project addresses only vaccine initiation rates; data collection on HPV vaccine series completion would also be beneficial when examining vaccine rate trends, but was not plausible secondary to time limitations for this project. However, newer evidence demonstrates that even one dose of HPV vaccine may be effective in preventing cancer. Therefore, it may be assumed that even the children who do not complete the series may still receive benefit from one dose.

Section Five: Recommendations and Implications for Practice

1. *Project Summary*

A provider communication education session was implemented in a pediatric primary care practice using evidence-based strategies that fuses information on HPV disease, HPV vaccination, parental communication strategies, high-quality language, cancer prevention, and supporting statistics. Provider vaccination initiation rates were examined 6 weeks prior to the education session implementation and 6 weeks post education session implementation to evaluate HPV vaccine initiation rate uptake. Quality Management Reports were created for each provider for HPV vaccination initiation rates for ages 11-18 years for the 6 weeks pre and post intervention implementation. Findings for this project support the current research that provider communication behaviors and recommendations consistently guide compliance in adolescents receiving the HPV vaccination.

2. *Implications for Practice*

An evidence-based quality improvement project, can provide the advanced practice nurse the an opportunity to use acquired knowledge and demonstrate leadership skills to assuredly

impact pediatric health outcomes and status. This provider communication education session was implemented to increase provider knowledge for discussions with patients with the goal to increase HPV vaccination rate. This project examined the application of evidence-based research, health plan leadership and change, quality indicators, and evidence analysis and evaluation (DNP Essential I, II, III). Future evaluation on parental satisfaction with provider guidance, provider recommendation quality improvement, parental confidence in vaccines, and provider-parent relationship quality will provide insight to adjusting HPV vaccine dialogue, as quality improvement is a continuous process.

The project serves as a center-specific health care policy redesign proponent in the advocacy of improved HPV vaccination rates to decrease HPV-related cancers, injurious sequelae, and local and national health care costs (DNP Essential V). It is also an example of interprofessional collaboration among providers and healthcare systems as adoption of improved communication behaviors impact parental decisions to vaccinate their children against HPV, thus improving community and population health outcomes and quality of care (DNP Essential VI, VII). DNP prepared advanced practice nurses are integral change agents in the design of intervention, implementation, and evaluation of HPV provider communication education sessions, educating and guiding providers, supporting staff, and administration to achieve ideal patient and health outcomes (DNP Essential VIII).

This project reflected the internal evidence collected in a real-life setting, supported by the literature that HPV vaccination rates are not progressing and a provider communication education session is a successful intervention driven by evidence to increase HPV vaccination rates. Recommendations for the practice intervention site include continued use of an evidence-based provider education intervention in the promotion of HPV vaccination and ongoing

surveillance of HPV vaccination trends and rates. It is recommended that the HPV provider communication education session's success on increasing HPV vaccination uptake be circulated to the health care organization's leadership and administration to further the dissemination of results and implementation in other healthcare settings, such as other pediatric or family practice primary care offices. Lastly, it is recommended further evaluation on parental satisfaction with provider guidance, provider recommendation quality improvement, parental confidence in vaccines, provider-parent relationship quality, and staying abreast of developing evidence-based literature will provide insight to HPV vaccine dialogue adjustments, as quality improvement is a sustained process.

3. *Methods of Dissemination*

Dissemination methods include: 1. Presentation of data findings and results for discussion to the pediatric primary care intervention site and 2. Presentation of data findings and results to specific medical group as well as the system-wide group provides an opportunity for the larger umbrella healthcare organization. 3. Publication.

The pediatric primary care intervention site is an appropriate dissemination of findings and performance based feedback to fully understand the impact we, as healthcare providers, can have on patient health outcomes and learning from evidence-based best practices. The system wide presentation of findings and results would be valuable to Providence Medical Group because it is composed mostly of family practice groups that would benefit from the HPV vaccine information, both as primary care and as the HPV vaccination has now been approved for ages 9-45 years according to the FDA (2018).

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APPENDIX A

SYNTHESIS TABLE

Study/ Author	**Year**	**# Participants**	**Mean age or other sample characteristic pertinent to your question**	**Study Design**	**Intervention**	**Major Finding that address your question**
Dempsey, A. et al. JAMA , 172, 1-9.	2018	43,132 adolescents; 188 medical professionals	50.3% female, median age 12.6 years	RCT	Info sheets, parent ed website, disease images, communication training	Key factor influencing HPV vaccination is whether and how HCP recommends it.
Hudson, S. et al. Vaccine, 34, 3515-3521.	2016	61 interviews	Pediatricians, Family doctors, immunization nurses	Qualitative	Analyzation	Communication was a factor that identified higher performer HPV vaccine rates.
Rand, C. et al. Pediatrics, 141, e20170498	2018	8 resident clinics	Staff and providers	QI	Communication training, performance feedback, learning collaborative calls	Training on the delivery of a strong provider recommendation and performance feedback can substantially increase captured HPV vaccination opportunities.
Clark, S. et al. Clinical Pediatrics, 55, 701-706.	2016	3,177 panel members; 786 respondents	Parent of one more children aged 9-17 years old	Cross-sectional survey	Survey on provider interactions	Study found that provider statements with a strong recommendation and a specific age to begin HPV series was associated with HPV vaccine status.
Sussman, A. Annals of Family	2015	98 RIOS Net Clinicians, 25 informant interviews	unknown	Qualitative/ Mixed methods	Interview and survey	Communication methods, social media, and health system improvement can increase HPV compliance.

Medicine, 13, 354-360.						
Gamble, H. et al. Jnl of Peds Psychology, 35, 704-715.	2010	Adolescents receiving/eligible to receive HPV vaccine	unknown	Lit. Review	Receiving HPV vaccine.	Pediatrician attitudes and intentions, HPV knowledge, beliefs about pt sexual hx, comfort of disc. sexual behaviors, and beliefs on the impact of HPV vaccine promote successful vaccine delivery.
Cates, J. et al. Vaccine, 36, 122-127.	2018	175 pediatric practices; primary sample 147, 294.	At least 100 11 and 12 yo who'd not completed HPV vaccine.	Meta-analysis	Received HPV vaccine initiation and completion over three 9 mo periods. Protect Them program.	17% increase was seen in practices with intervention implemented in initiation and completion of HPV vaccine series.
Fairbrother, G. et al. Academic Peds, 13, 387-389.	2013	14 IOM members	unknown	Meta-analysis	Reviewed concerns about immunization schedule.	IOM suggested providers consider communication training to improve patient-provider communications around immunization issues, as parents rely on their professional advice.
McRee, A. and Gilkey, M. Jnl of Ped Health, 28, 541-549.	2014	615 respondent health care providers, 3923 were invited to participate	20% pediatricians, 47% family physicians, 33% nurse practitioners	Lit. Review/ RCT	HPV vaccine recommendation and parental hesitancy.	HPV vaccine compliance stresses the importance of increasing the frequency and quality of recommendations. HCP role is most important to influence HPV vaccination.
Zimet, G. Preventative Medicine, 57, 414-418.	2013	Behavioral and social science literature on	unknown	Lit. Review	Receiving the HPV vaccination.	HCPs must be well-informed about current guidelines and safety to communicate with parents about HPV vaccine. HCP

		HPV attitudes and uptake.				recommendation is among the most important determinants of HPV vaccination.
Moss, J. Social Science & Medicine, 159, 100-107.	2016	39,811 eligible; 32, 429 completed interviews; 23,738 consented to provider verification.	Caretakers of 13 to 17 yo adolescents	Descriptive	Provider recommendation of HPV vaccination.	Efficient communication styles were rarely used but highly effective for recommending the HPV vaccine.
Gilkey, M. et al. Preventative Medicine, 77, 181-185.	2015	776 US physicians; 53% pediatricians, 47% family medicine	unknown	Descriptive	Recommending adolescent vaccinations in a communication context.	Physicians chose to discuss HPV vaccine last; communication strategies are needed to support recommendations with greater confidence and efficiency.
Smith, P. et al. Vaccine, 34, 1604-1610.	2016	4437 parents sampled in the 2010 Nat'l Immunization Survey-Teen (13-17 yo teens)	Parental beliefs data on vaccines	Descriptive	Received HPV vaccination.	HPV vaccine coverage can be increased through HCP talking about the vaccine, giving parents time to discuss vaccine, and by making a strong recommendation for the HPV.
Gilkey, M. et al. Vaccine, 34, 1187-1192.	2016	1495 parents of 11-17 yo adolescents	Which types of recommendations are most influential	RCT	Recommending the HPV vaccination.	Intervention is needed to improve not only whether, but how providers recommend HPV vaccination for adolescents.
Finney, L. et al. Vaccine, 35, 164-169.	2017	280 primary care clinicians looking at HPV completion among 9-18 yo.	Clinician knowledge and barriers and perceived parental barriers	Descriptive	HPV vaccination series completion, survey.	Greater knowledge of HPV and HPV vaccination was associated with higher rates of HPV vaccination initiation and completion.

Perkins, R. et al. Vaccine, 33, 1223-1229.	2015	2 intervention health centers (4093 patients) and 6 control health centers (9025 patients)	Initiation and completion rates of boys and girls 11-21 years old	Descriptive	QI incentives, repeated contacts, education, and individualized feedback.	Interventions improved vaccination rates and had potential to produce sustained HPV vaccination rates.
Kornides, M. et al. Vaccine, 36, 2637-2642.	2018	Parents of 11 to 17 yo adolescents (795)	Parents who had discussed the HPV vaccine with HCP at least once	Descriptive	Provider communication satisfaction association with HCP communication and HPV vaccination.	High-quality provider recommendation includes strong endorsement for same-day vaccination and emphasis on cancer prevention. Parental satisfaction with HCP counseling is also important with HPV vaccination initiation and completion.
Groom, H. et al. Jrnl of Public Health Mngt and Practice, 23, 589-592.	2017	9 primary care facilities within the Kaiser Permanente Northwest (KPWN) health system	Primary care, male and female adolescents	Qualitative	System-wide assessment and feedback intervention, education session including HPV info, parental communication strategies, and facility-specific coverage data.	Working collaboratively with health care system and state partners to develop an intervention for population directly served to improve HPV vaccination rates.
White, M. Translational Andrology and Urology, 3, 429-434.	2014	Articles from Medline literature search (1998-present)	unknown	Lit. Review	HPV vaccination regimens for teenagers.	Ethical issues include people abstaining from sexual activity, does vaccine increase sexual relations, research costs, and practical aspects of recommending HPV vaccine to parents and patients.

Reno, J. et al. Jrnl of Health Communication, 23, 313-320.	2018	Healthcare providers and staff at 16 pediatric and family medicine clinics (8 intervention, 8 control); 10 private, 6 public practices	Healthcare offices serving adolescents. Have at least 500 active adolescent patients, vaccination rates < 80%, and offer HPV vaccine.	RCT	Motivational Interviewing included in communication HCP training.	Intervention improved providers' communication with HPV-hesitant parents improved HPV vaccine acceptance.

Legend example: D=depression; Q=quasi-experimental design; RCT=randomized controlled trial; CC=case control; CD=cohort design; ↑ = increased; ↓ = decreased; ↔ = no effect; HPV=Human papilloma virus; HCP= Health Care Provider

EVALUATION TABLE

Author (year)	**Conceptual Framework**	**Design/ Method**	**Sample/ Setting**	**Major variable studied and their def.**	**Measure-ment**	**Data Analys.**	**Findings**	**Appraisal**
Dempsey, A. et al. (2018). JAMA, 172, 1-9.	None	RCT, 5 interventions of info sheets, website, disease images, comm. Training over 6 months	188 med prof, 43132 adol.; 16 primary care offices, Denver, CO	Diff. b/w Intervent and control changes over time	HPV vacc initiation and completion.	Practice records/ State immun. Info system data	Key factor influencing HPV vacc is how and whether HCP recommends it.	HCP is key to HPV vaccination.
Hudson, S. et al. (2016). Vaccine, 34, 3515-3521.	None	Analyzed data from 61 qualitative interviews and demographic interview	Peds, Family doctors, Immun nurses	HPV vaccine completions rates	Qualit., vaccine rates	Coded by 2 doctoral-level invest, content analysis NVivo 10	Communication was a factor identified with higher HPV vaccine rates.	HCP communication important to increase HPV vaccine rates.
Rand, C. et al. (2018). Pediatrics, 141, e20170498	None	12-month study QI in a national practice-based research network of pediatric resident practices (8)	Staff and providers, peds resident practices	HPV vaccine opportunities and reasons completed or not	HPV vaccine administ.	Descrip Statistics and Pearson's x2 test; P chart using Microsoft Excel QI Macros	Training on the delivery of a strong provider recommend and perform feedback can increase HPV vaccine opportune.	Comm training can increase HPV vaccine rates.
Clark, S. et al. (2016). Pediatrics,	None	Cross-sectional national survey; KnowledgePan	3, 177 panel member, 786 respondent parents;	Provider interactions and perspectives	22-question survey	Analy conducted at respondent level and 3 variables	HCP statements with strong recommend and a specific age to begin was assoc with HPV vaccine status.	HCP Recommend and clarity of age to begin are strategies to

55, 701-706.		el probability based	online	on HPV vaccine				increase HPV vaccine rates.
Sussman, A. (2015). Annals of Family Medicine, 13, 354-360.	None	Mixed methods; 1st qualitative, in-depth interview followed by confirmatory survey	98 Rios Net clinicians, 25 inform interviews in person, 2 telephone, NM	Factors that influence HPV vaccination	Common themes	Iterative analytic process, survey to address general themes	Comm methods, social media, health system improvement can increase HPV compliance.	Comm and health systems can increase HPV vaccine rates.
Gamble, H. et al. Jnl of Peds Psychology, 35, 704-715.	None	Literature searches using PubMed and PsychInfo	Adolescents receiving/eligible to receive HPV vaccine	Psych and environ factors related to HPV vaccine uptake and intentions	HPV vaccine uptake	Literature Review	Peds attitudes and intentions, HPV, knowledge, beliefs, and comfort of disc sexual behaviors impact HPV vaccine delivery.	Intervention to increase HPV vaccine rates should target intent and family-provider communication.
Cates, J. et al. (2018). Vaccine, 36, 122-127.	None	Protect Them study tests over three 9-month periods	175 Peds practice; 147,294 primary sample; NC equal geographic areas	Effectiveness of practice based intervention	Initiation of HPV series, completion of series	Cox models	17% increase seen in practices with communication intervention.	Communication interventions, including provider training increased initiation and completion of HPV series.
Fairbrother, G. et al. (2013). Academic Peds, 13, 387-389.	None	Review of childhood immunization schedule by IOM	14 IOM members	Safety of childhood immuniz schedule	Review of concerns about Immuniz schedule	Literature Review	IOM suggested providers consider communication training as parents rely on professional advice.	Parent-provider communication is important when recommend immmuniz.

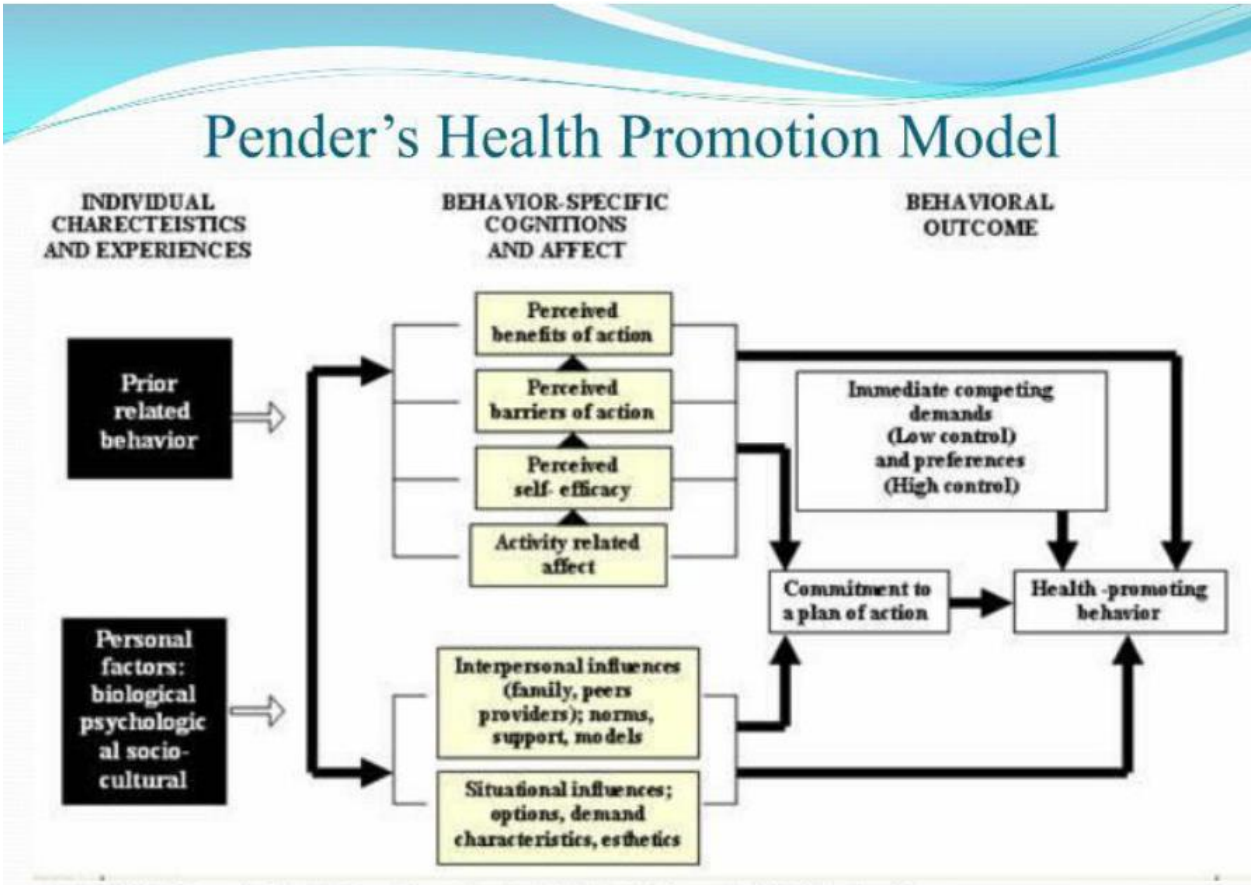
McRee, A. and Gilkey, M. (2014). Jnl of Ped Health, 28, 541-549.	None	Online survey completed statewide of Minnesota HCPs	615 respondent HCPs, 20% peds, 47% family physicians, 33% NPs	HPV recommend ation practices and perceptions of parental hestinancy	Survey	X2 analyses; Stata SE version 10.0 using 2-tailed tests and a critical alpha of 0.05	HPV compliance stresses the importance of increasing freq and quality of recommedations.	HCP is most important to influence HPV vaccination
Zimet, G, (2013). Preventati ve Medicine, 57, 414-418.	None	Selective review of behavioral and social science literature	Lit review on HPV vaccine attitudes and uptake	HPV		Lit review	HCPs must be well-informed about current guidelines and safety to communicate with parents.	HPC is among the most important determinants of HPV vaccination.
Moss, J. (2016). Social Science & Medicine, 159, 100-107.	None	Gathered info from healthcare provider-verified data in the 2010 Nat'l Immunization Survey-Teen	32, 429 completed interviews; 23,738 consented to provider verification. Caretakers of 13-17yo adolesc.	Provider recommedat ion for HPV vaccine.	Collinearity for provider recommend ation and communicat ion style.	Chi-square tests to examine bivariate assoc. of vaccine.	Efficient communication styles were rarely used but highly effective for recommending HPV vaccine.	Proper communication styles create effective recommendation s for HPV vaccine.
Gilkey, M. et al. (2015). Preventati ve medicine, 77, 181-185.	None	Online survey assessing physicians perceptions and communicatio n practices	776 US physicians, 53% peds, 47% family medicine	Perceptions and comm practices	Physician responses to survey, HPV compared to Tdap and Mening.	McNemar's test for dichotomous variable and paired t-tests for continuous variable s.	HPV vaccine was discussed last, communication strategies are needed to support recommendations with greater	Communication strategies are needed to improve HPV vaccine recommendtion.

							confidence and efficiency.	
Smith, P. et al. (2016). Vaccine, 34, 1604-1610.	None	2010 Nat'l. Immunization Survey-Teen for parental beliefs and demographic factors. HPV vaccine status was determined from teens' HCP records.	4437 parents sampled	Parental beliefs data on vaccines	HPV vaccine status.	Survey library in the R statistical software package. All estimates account for the sampling weights/design.	HPV vaccine coverage can be increased by HCP talking about the vaccine, giving parents time to discuss, and by making a strong recommendation.	HCP communication can increase HPV vaccine coverage.
Gilkey, M. et al., Vaccine, 34, 1187-1192.	None	Online survey using quality indicators	1495 Parents of 11-17 yo adolescents.	Types of recommend ations , HPV vaccine endorsemen t, same-day vaccination, and disc cancer prevention.	American Assoc. for Public Opinion Research guidelines for Response Rate.	Multivariable logistic regression to assess associations bw HPV vaccine recommendatio n quality and HPV vaccine behavior.	Intervention is needed to improve not only whether, but how providers recommend HPV vaccination for adolescents.	High-quality recommendation s were strongly assoc with HPV vaccine behavior.
Finney, L. et al. (2017). Vaccine, 35, 164-169.	None	Survey from October 2015 to January 2016 in a 27-county geographic region. Rochester	280 primary care clinicians.	HPV completion among 9-18 yo.	Clinician knowledge, barriers, and perceived parental barriers.	Examined assoc bw rates of HPV vaccination initiation and completion at the practice level using	Greater knowledge of HPV and HPV vaccination was associated with higher rates of HPV vaccination initiation and completion.	HCP knowledge was associated with higher rates of HPV vaccination.

		Epidemiology Project was used to measure HPV vaccination delivery				admin data and clinician knowledge, barriers, and perceived parental barriers. Responses were aggregated into composite scores.		
Perkins, R. et al. (2015). Vaccine, 33, 1223-1229.	None	Provider-focused intervention, then intervention was compared to baseline and 2 f/u periods	2 intervention health centers and 6 control health centers	Intervention and HPV vaccine.	Initiation and completion rated of boys and girls, 11-21 years for HPV vaccine	Multi-variable logistic regression accounting for clustering by practice.	Interventions improved vaccination rates and had potential to produce sustained HPV vaccination rates.	QI incentives, repeated contacts, education and individualized feedback improved HPV vaccine rates.
Kornides, M. et al. (2018). Vaccine, 36, 2636-2642.	None	Parents of 11-17 yo adolescents who disc HPV with a HCP at least once completed online survey. Satisfaction was assessed using HPV Vaccine Communicatio	795 parents of adolescents 11-17 yo.	HPV vaccine	Satisfaction (low, mod, high) and 3 vaccine behaviors (refusal/delay, series initiation, continuation)	Multi-variable logistic regression examining vaccine behaviors and satisfaction.	High-quality recommendation included strong endorsement for same-day vaccination and emphasis on cancer prevention. Parent satisfaction with HCP counseling is important in HPV vaccine initiation and completion.	HCP communication is important for HPV vaccination and completion.

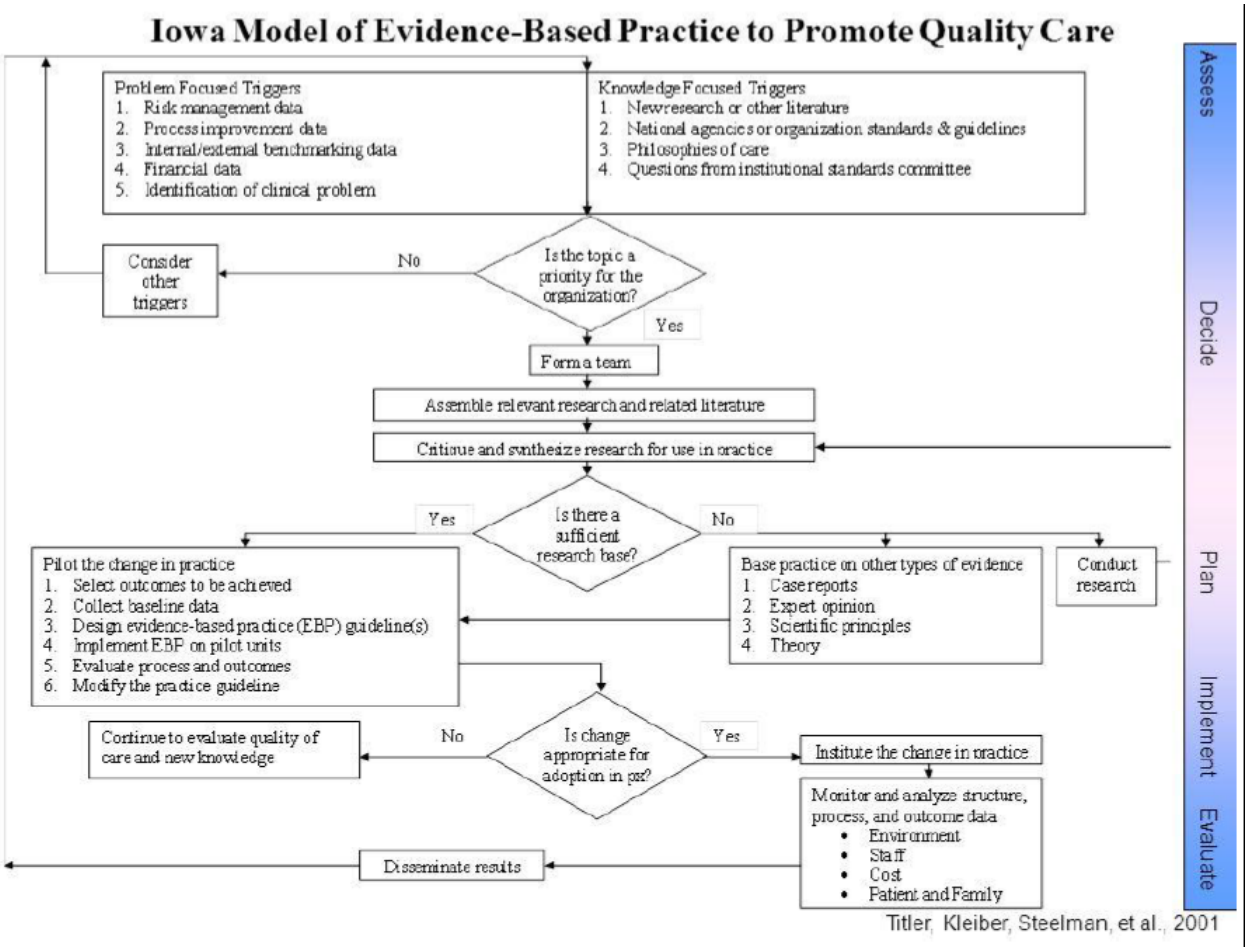
		n Satisfaction Scale.						
Groom, H. et al. (2017). Jnl of Public Health Mngt and Practice, 23, 589-592.	None	Implemented system-wide assessment and fdback intervention to promote HPV vaccination. 12 months post intervention, looked at HPV vaccination coverage.	Nine primary care facilities within Kaiser Permanante Northwest health care system.	Ed session combining info on HPV infection, parental communication strategies, and facility-specific cov. data.	HPV vaccination rates.	Assessment report data and HPV vaccination rate increasing.	Collaborative partnership to develop an intervention directly for the population served improves HPV vaccination rates.	Feedback, education for HCP about HPV and communication strategies increase HPV vaccine initiation rates.
White, M. (2014). Translational Andrology and Urology, 3, 429-434.	None	Articles were obtained from an extensive Medline literature search (1998-present) to evaluate the current HPV vaccination regimens for teenagers.	unknown	HPV regimens	unknown	Literature Review	Ethical issues include people abstaining from sexual activity, does vaccine increase sexual relations, research costs, and practical aspects of recommending HPV vaccine to parents and patients.	Ethical issues influence HPV vaccine.
Reno, J. et al. (2018). Jnl of Health Communication, 23, 313-320.	None	RCT from practice-based research network	8 peds and family med clinics, 8 control; 10 private, 6 public	Motivational Interviewing	HPV-hesitant parents HPV acceptance rates.	Analysis of transcripts was team-based and followed established qualitative method.	Intervention improved providers' communication with HPV-hesitant parents improved HPV vaccine acceptance.	HCP communication interventions improve HPV vaccine acceptance.

APPENDIX B

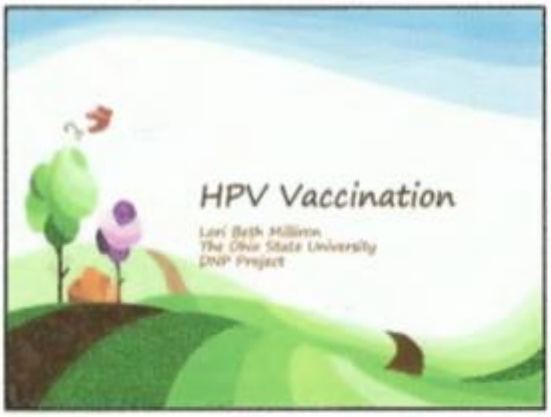


Revised Health Promotion Model. (From Current Nursing (2010) *Health Promotion Model.* Retrieved from http://currentnurisng.com/nursing_theory/health_promotion_model.html)

APPENDIX C


Iowa Model of Evidence-Based Practice to Promote Quality Care
Problem Focused Triggers
1. Risk management data
2. Process improvement data
3. Internal/external benchmarking data
4. Financial data
5. Identification of clinical problem
Knowledge Focused Triggers
1. New research or other literature
2. National agencies or organization standards & guidelines
3. Philosophies of care
4. Questions from institutional standards committee
Is the topic a priority for the organization?
No
Consider other triggers
Yes
Form a team
Assemble relevant research and related literature
Critique and synthesize research for use in practice
Is there a sufficient research base?
Yes
No
Pilot the change in practice
1. Select outcomes to be achieved
2. Collect baseline data
3. Design evidence-based practice (EBP) guideline(s)
4. Implement EBP on pilot units
5. Evaluate process and outcomes
6. Modify the practice guideline
Base practice on other types of evidence
1. Case reports
2. Expert opinion
3. Scientific principles
4. Theory
Conduct research
Is change appropriate for adoption in pr?
No
Yes
Continue to evaluate quality of care and new knowledge
Institute the change in practice
Monitor and analyze structure, process, and outcome data
• Environment
• Staff
• Cost
• Patient and Family
Disseminate results
Assess
Decide
Plan
Implement
Evaluate
Titler, Kleiber, Steelman, et al., 2001

APPENDIX D


HPV Vaccination
Lori Beth Milliron
The Ohio State University
DNP Project


DNP Project- Why You're Here
HPV vaccine initiation rates
Pre-strategy data collection- 6 weeks
Post-strategy data collection- 6 weeks
Final submission of project report early March
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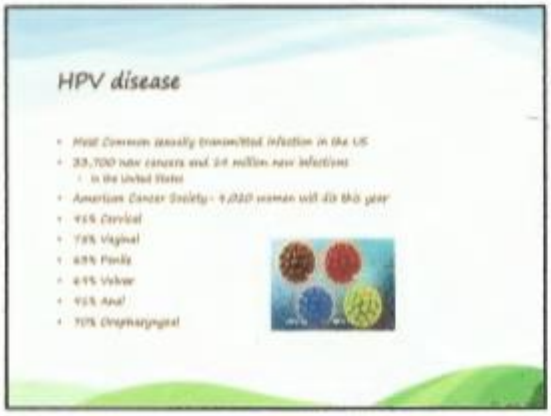
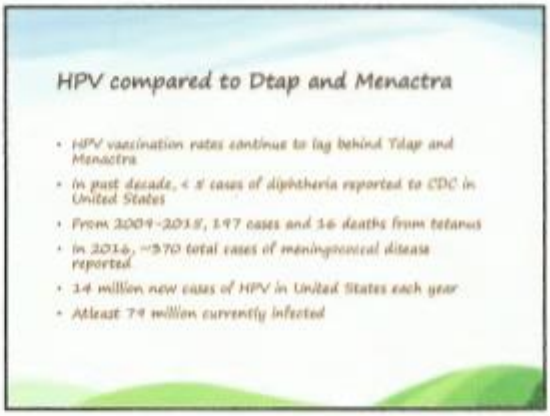
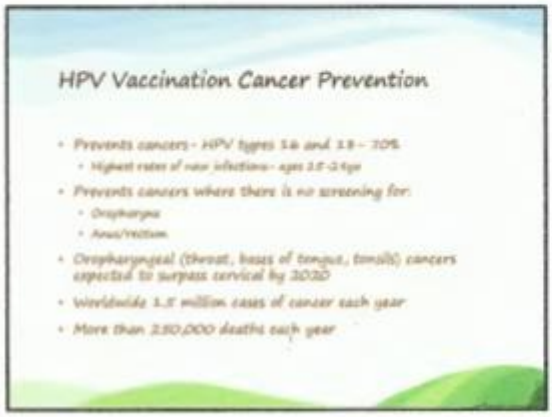
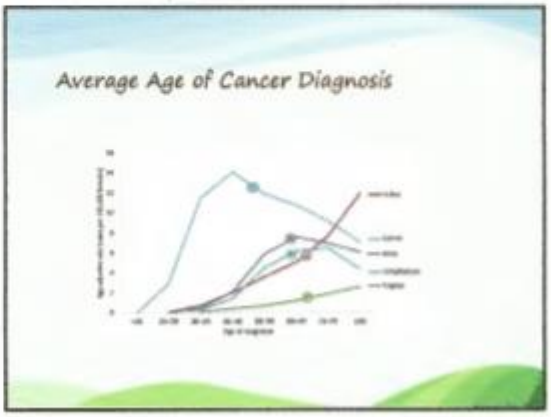

HPV disease
Most Common sexually transmitted infection in the US
33,700 new cancers and 14 million new infections
in the United States
American Cancer Society- 4,020 women will die this year
91% Cervical
78% Vaginal
69% Penile
69% Vulvar
91% Anal
70% Oropharyngeal


HPV compared to Dtap and Menactra
HPV vaccination rates continue to lag behind Tdap and Menactra
In past decade, < 5 cases of diphtheria reported to CDC in United States
From 2009-2013, 197 cases and 16 deaths from tetanus
In 2016, ~570 total cases of meningococcal disease reported
14 million new cases of HPV in United States each year
Atleast 79 million currently infected


HPV Vaccination Cancer Prevention
Prevents cancers- HPV types 16 and 18- 70%
Highest rates of new infections- ages 15-24yo
Prevents cancers where there is no screening for:
Oropharynx
Anus/rectum
Oropharyngeal (throat, base of tongue, tonsils) cancers expected to surpass cervical by 2020
Worldwide 1.5 million cases of cancer each year
More than 250,000 deaths each year


Average Age of Cancer Diagnosis

HPV Vaccination Rates

- Department of Health and Human Services report
  - Healthy People 2020
- Goal of 80% of coverage
  - Ohio 50-59%
  - National 40%
- Boys lagging- less than half national average
- HPV Vaccination Rates are not progressing...WHY?

Increasing Vaccination Rates

- Health Care Provider communication behaviors
  - Research shows crucial to improve vaccination rates
  - Primary Care- Majority where HPV vaccine given
- Need to be properly prepared to respond to parent
  - Misinformation -Social Media -Lack of significant other support
- Information Deficits
- Lack of HPV Vaccination knowledge

Provider Communication Education

- Information on HPV disease
- HPV Vaccination and schedule
- Parental communication strategies
- High-quality recommendation verbiage
- Emphasizing cancer prevention

Call to Action for Healthcare Providers

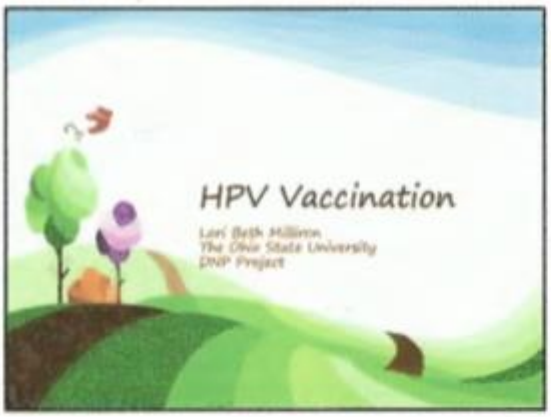
- Recommend HPV Vaccine with the same strength and conviction as Dtap and Menactra
- Be educated on HPV and HPV vaccines
- Inform colleagues and staff so same HPV messages being delivered
- Communicate HPV vaccine benefits to parents and adolescents at every opportunity
- Make vaccine procedures routine and focus on ways to prevent missed opportunities

Parental Concerns

- HPV vaccines DO NOT increase promiscuity
  - No data to support this
- HPV vaccines DO NOT cause more pain than other vaccines
- HPV vaccine DO NOT cure or treat existing HPV infections or cancers
  - Preventative only

Reasons Parents Do Not Vaccinate

- Lack of clear recommendation from their health care provider
- Not aware vaccine is recommended, especially in males
- Lack of knowledge about the number and types of cancer that HPV causes
- Son or daughter not sexually active/too young for vaccine
- Cost of vaccines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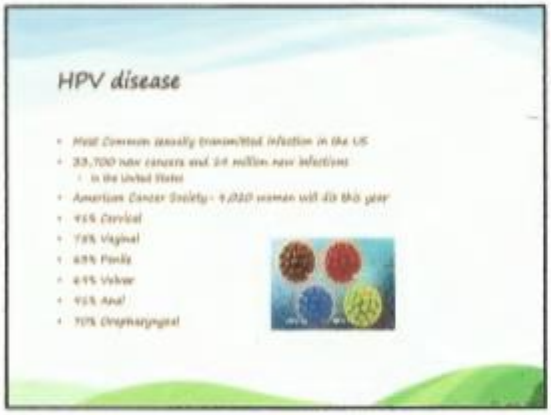
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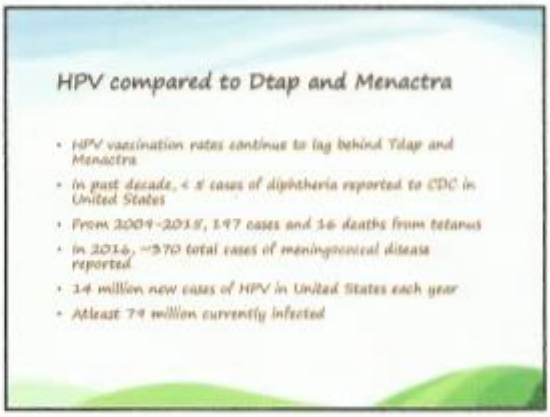
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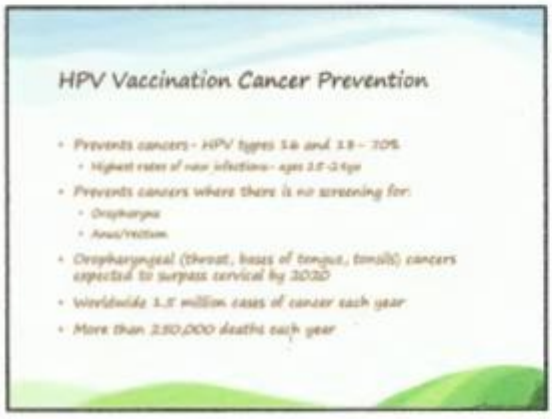
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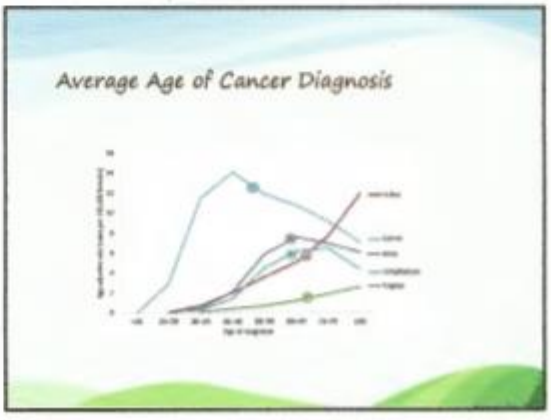
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